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Short Communication

Retrospective cohort study of gastrointestinal stasis in pet rabbits

M. Huynh, S. Vilmouth, M. S. Gonzalez, D. Calvo Carrasco, N. Di Girolamo, N. A. Forbes

GASTROINTESTINAL stasis is a common syndrome in pet rabbits characterised by decreased or absent faecal output, decreased appetite, abdominal discomfort and lethargy (Harcourt-Brown 2002, 2007a, b, Oglesebee and Jenkins 2012, Varga 2014). Pathophysiological factors such as anorexia, pain, stress, dehydration, improper diet and trichobezoars can slow or inhibit gastrointestinal motility (Campbell-Ward 2012, Oglesebee and Jenkins 2012, Varga 2014). Clinical findings such as anorexia and lack of faecal production, in combination with radiographic findings of gaseous dilatation of the stomach, intestines and caecum, are well documented for diagnosing gastrointestinal stasis (Lichtenberger and Lennox 2010). However, there are very few data available in the literature about epidemiology of gastrointestinal stasis in pet rabbits.

This short communication describes a retrospective study about cases of gastrointestinal stasis diagnosed in pet rabbits presented to an exotic animal referral practice in England over a five-year period. Animals that were subsequently diagnosed with other diseases not directly related with the gastrointestinal tract were excluded from the study. Rabbits that underwent surgery within the month previous to the gastrointestinal episode were also excluded. The results were compared with a reference population that was constituted of all the rabbits presented for consultation over the same five-year period. Relative risk (RR) with 95% CIs was calculated and χ^2 test were performed using a statistical software package (SPSS V.20.0, IBM).

Breeds, sex, age, date of occurrence and dental status at admission were systematically recorded. To examine the effect of phenotypic selection, the rabbits were classified into Dwarf Lop, long-haired and other breeds. Dwarf Lop, Mini Rex, Netherland Dwarf and Lion Head were considered Dwarf breeds. French Lop, English Lop and Dwarf Lop were classified as Lops. Lion Head and Angora were classified as long-haired breeds. A dental examination was performed on all rabbits presenting with gastrointestinal stasis as part of the hospital admission process.

Gastrointestinal stasis occurred in 96 rabbits that presented 166 times; 63 rabbits (66 per cent) experienced only a single episode of

gastrointestinal stasis. During the same period, a total of 382 rabbits were seen at the practice. The prevalence of the disease within the population studied was 25.1 per cent (96/382).

Based on the classification described, 41 rabbits were Dwarfs, 45 were Lops and 7 were long-haired breeds. Within the reference population, 71 were Dwarf, 62 were Lops and 19 were long-haired breeds (Table 1).

Dwarf rabbits were 1.34 (95% CI 1.15 to 1.55) times as likely to have gut stasis as a non-dwarf rabbit ($P<0.001$). Lop rabbits were 1.48 (95% CI 1.26 to 1.75) times as likely to have gut stasis as non-lop rabbits ($P<0.001$). Long-haired rabbits did not have a significant higher probability to suffer of gastrointestinal stasis compared with non-long-haired rabbits (RR: 1.09, 95% CI 0.86 to 1.39; $P=0.3$).

Gender was determined at the time of presentation and rabbits were classified as male, male-castrated, female or female-spayed. There were 54 males, 33 male-castrated, 42 females and 35 female-spayed rabbits that presented for gastrointestinal stasis. In the general population, there were 204 males and 178 females over that period. No sex predisposition was found in the occurrence of gastrointestinal stasis. Male rabbits did not have a higher probability of presenting with gastrointestinal stasis compared with female rabbits (RR: 1.02, 95% CI 0.93 to 1.11; $P=0.6$).

The mean age of onset for gastrointestinal stasis in the studied population was 3.1 ± 1.9 years old. The age ranged from six months old to nine years old at the time of presentation. Fig 1 shows the distribution of gastrointestinal stasis in male and female rabbits depending on their age.

The number of presentations per month ranged from 9 (February, April and December) to 21 (March). When the episodes were classified by season, 22 per cent of the episodes occurred in spring, 29 per cent in summer and 19 per cent in autumn and 30 per cent in winter. No significant effect of months ($P=0.2$) or in season ($P=0.1$) were found on the occurrence of gastrointestinal stasis.

Moderate-to-severe dental disease requiring a corrective procedure was found in 32 cases (19 per cent), mild dental disease not requiring correction was found in 24 cases (15 per cent) and 110 cases (66 per cent) had no dental abnormalities.

Based on the findings in this study, gastrointestinal stasis is a common condition affecting one-quarter of all rabbits presented to veterinarians. It affects mainly young adult rabbits, and Dwarf and Lop breeds are over-represented. No sex or seasonal predispositions were demonstrated. The fact that some breed may be over-represented could reflect the influence of genetic selection on digestive anatomy and behaviour in those individuals. Long-haired breeds were especially studied because fur ingestion might be a predisposing factor of gastrointestinal stasis. Trichobezoars were determined to be a major cause of death in colonies of Angora rabbits (Mondal and others 2006). However, the small proportion of long-haired rabbits in the total population (19/382 rabbits) precludes any conclusions on the influence of this parameter.

Since many cases of gastrointestinal stasis appear associated with the presence of trichobezoars, episode peaks were anticipated during moulting in spring and autumn (Hale 1945). However, there was no significant time of year predisposition to gastrointestinal stasis. The

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TABLE 1: Breeds of rabbits presenting for gastrointestinal stasis or other condition (reference population) over a five-year period

	Rabbits presenting for gastrointestinal stasis		Rabbits presenting for other conditions	
		Per cent		Per cent
Dwarf breed*	41	43	71	19
Lop breed*	45	47	62	16
Long-haired breed*	7	7	19	5
Other breeds	33	34	286	74

*Some breeds such as Dwarf Lops were classified as both a Dwarf and a Lop breed. See text for full description. Consequently, summation of percentage representation values in each column exceeds 100

Short Communication

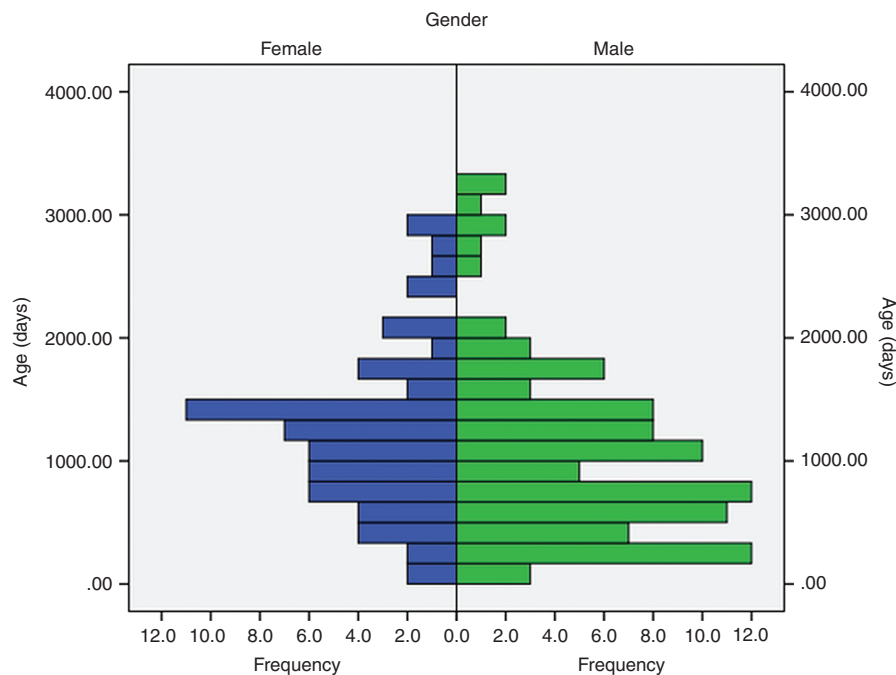


FIG 1: Age pyramid showing the distribution of age groups in the population of female and male rabbits affected by gastrointestinal stasis. Notice the asymmetry of the pyramid caused by an under-representation of young female rabbits

indoor lifestyle of many rabbits may alleviate the effect of moulting on gastrointestinal stasis.

Disturbed gastrointestinal mobility is proposed to be related to dental health and diet in rabbits (Crossley 2003, Harcourt-Brown 2007a, b). In this study, most rabbits presenting for gastrointestinal stasis did not have dental disease. It is possible that episodes of gastrointestinal stasis occur before dental disease arises or that the two conditions evolve independently. Further studies are needed to assess this relationship.

There are limitations to this study as the patient group was not collected prospectively and clinical data were therefore not standardised, and the control group may not be representative. The reference population is limited to the rabbits seen in consultation but does not include cases lost to follow-up or the general pet rabbit population in this area.

Diet is an important factor that was not investigated in this study. Dietary fibre and carbohydrate are important factors that affect gastrointestinal motility. High fibre and low starch are necessary to prevent digestive problems in rabbits (Lichtenberger and Lennox 2010, Campbell-Ward 2012, Oglesebee and Jenkins 2012, Varga 2014). This aspect was not investigated since quantification of the real food intake by the rabbit when based only on the history of the owner was considered unreliable. Most owners reported giving their rabbits having a mixture of hay, pellet and fresh vegetables. Diet needs to be evaluated in prospective studies to determine its impact on gastrointestinal stasis.

In conclusion, gastrointestinal stasis is a common syndrome in rabbits presented to a veterinary practice, affecting mainly young adult individuals.

Correction notice This article has been corrected since it was published Online First. The author surnames have been corrected as follows: D. Calvo Carrasco instead of D.C. Carrasco, and N. Di Girolamo instead of N.D. Girolamo. In the fourth paragraph, the sentence 'During the same period, 382 other rabbits were seen at the practice'. was corrected to 'During the same period, a total of 382 rabbits were seen at the practice'.

References

- CAMPBELL-WARD, M. (2012) Gastrointestinal Physiology and Nutrition. In *Ferrets, Rabbits and Rodents: Clinical Medicine and Surgery*. Eds K. E. QUESENBERY. Elsevier-Saunders. pp 183-192
- CROSSLEY, D. (2003) Oral biology and disorders of lagomorphs. *The Veterinary Clinics of North America. Exotic Animal Practice* **6**, 629-659
- HALE, C. W. (1945) Colour and growth of hair in rabbits. *Nature* **155**, 670-671
- HARCOURT-BROWN, F. (2007a) The progressive syndrome of acquired dental disease in rabbits. *Journal of Exotic Pet Medicine* **16**, 146-157
- HARCOURT-BROWN, F. M. (2002) Digestive disorders. In *Textbook of Rabbit Medicine*. Eds F. M. HARCOURT-BROWN. Butterworth-Heinemann. pp 249-291
- HARCOURT-BROWN, T. (2007b) Management of acute gastric dilation in rabbits. *Journal of Exotic Pet Medicine* **16**, 168-174
- LICHTENBERGER, M. & LENNOX, A. (2010) Updates and advanced therapies for gastrointestinal stasis in rabbits. *The Veterinary Clinics of North America. Exotic Animal Practice* **13**, 525-541
- MONDAL, D., RISAM, K. S., SHARMA, S. R. & AL, E. (2006) Prevalence of trichobezoards in Angora rabbits in sub-temperate Himalayan conditions. *World Rabbit Science* **14**, 33-38
- OGLESEBEE, B. L. & JENKINS, J. R. (2012) Gastrointestinal diseases. In *Ferret, Rabbits, Rodents Clinical Medicine and Surgery*. Eds K. E. QUESENBERY, J. W. CARPENTER. Saint Louis, Elsevier. pp 201-202
- VARGA, M. (2014) Digestive disorders. In *Textbook of Rabbit Medicine*. 2nd edn. Eds M. VARGA. Butterworth-Heinemann. pp 303-349



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